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Loomis

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(54) **ARCHITECTURE FOR ROUTING
MULTI-CHANNEL COMMANDS VIA A TREE
COLUMN**

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(22) Filed: **Jan. 19, 2013**

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(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. 13/288,114, filed on Nov. 3, 2011, now abandoned, which is a continuation-in-part of application No. 12/836,425, filed on Jul. 14, 2010, now Pat. No. 8,053,042.

(60) Provisional application No. 61/225,258, filed on Jul. 14, 2009.

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A41G 1/00 (2006.01)
H05B 37/02 (2006.01)

(52) **U.S. Cl.**
CPC **A41G 1/005** (2013.01); **A41G 1/007**
(2013.01); **H05B 37/029** (2013.01); **H05B**
37/0281 (2013.01)

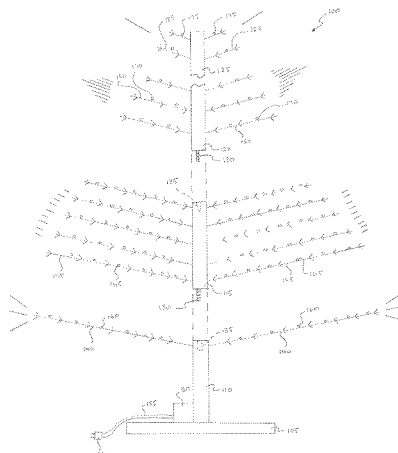
(58) **Field of Classification Search**
None

See application file for complete search history.

(57) **ABSTRACT**

Apparatus and associated methods may relate to an artificial tree apparatus having a plurality of trunk segments that couple together to provide a plurality of information or command signals to load devices connected thereto. In an illustrative example, one or more branch segments having light emitting devices are connected to the trunk segments to independently receive the electrical power and command signals via a control system. In some implementations, each command signal generated by the control system may include data pertaining to light color and illumination pattern. In some embodiments, each branch segment and associated light emitting devices may be independently controlled via a multi-channel arrangement. In some implementations, each group of light emitting devices may be manually configured via one or more user-interfaces. In various implementations, each trunk segment may include an axial electrical connector which permits adjacent trunk segments from being connected in any radial orientation relative to each other.

26 Claims, 10 Drawing Sheets



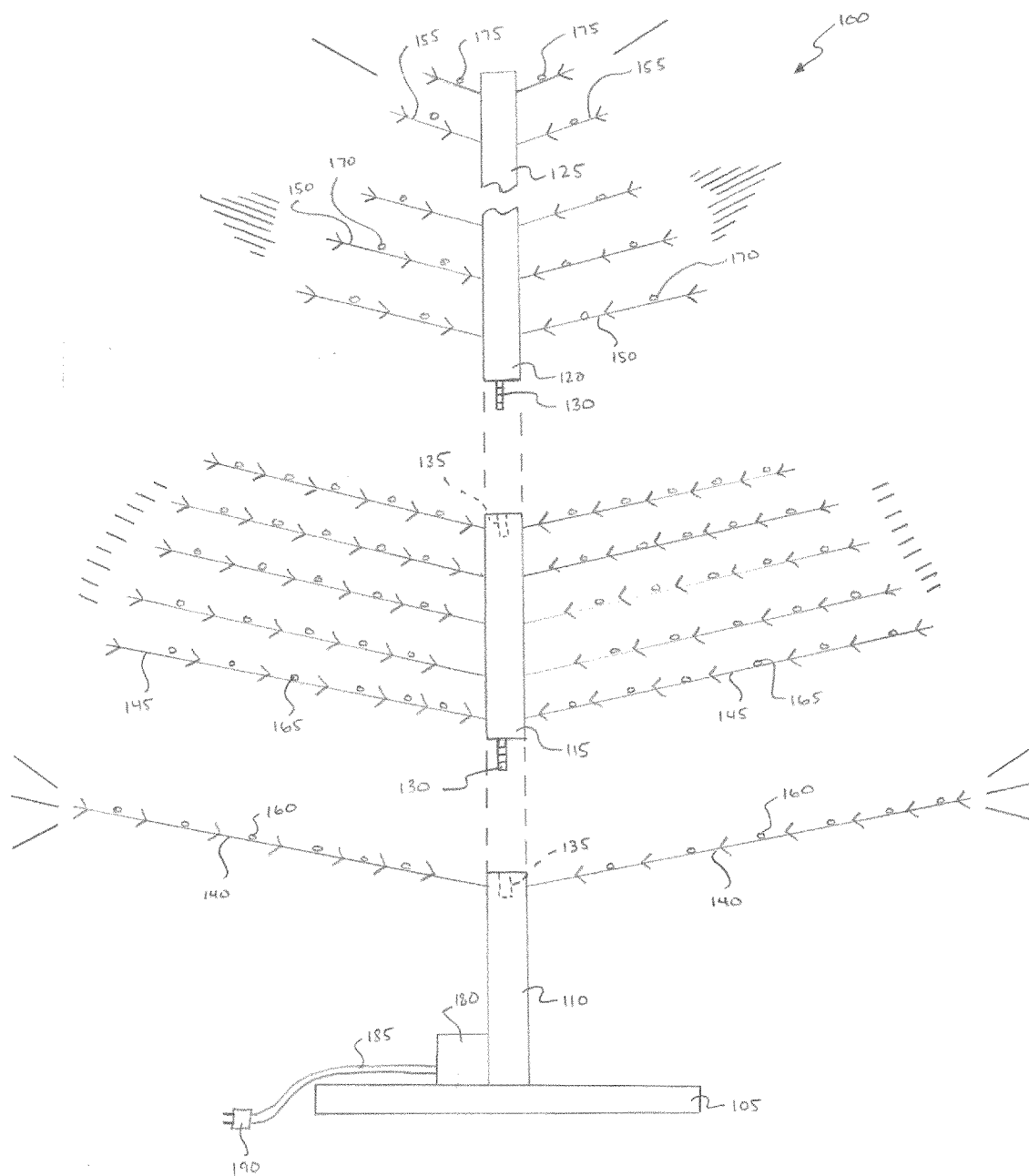


FIG. 1

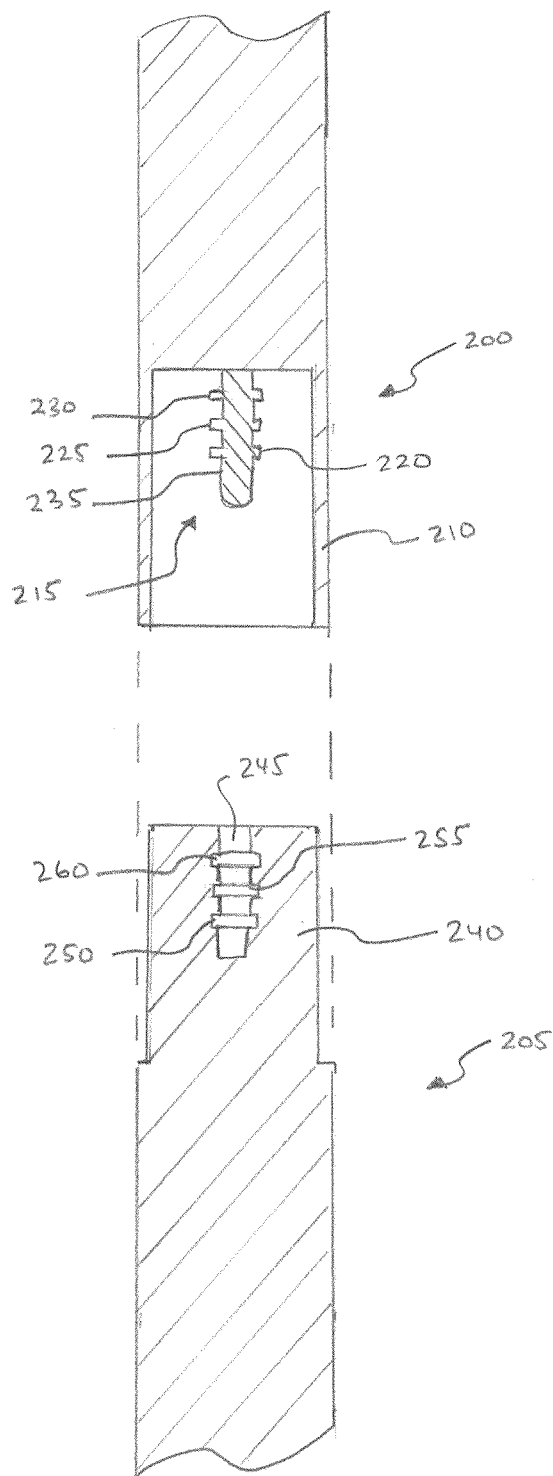


FIG. 2

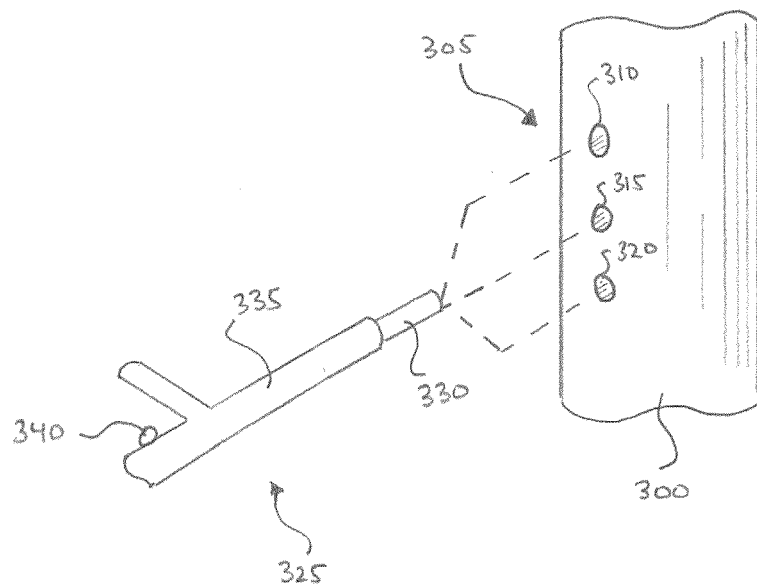


FIG. 3

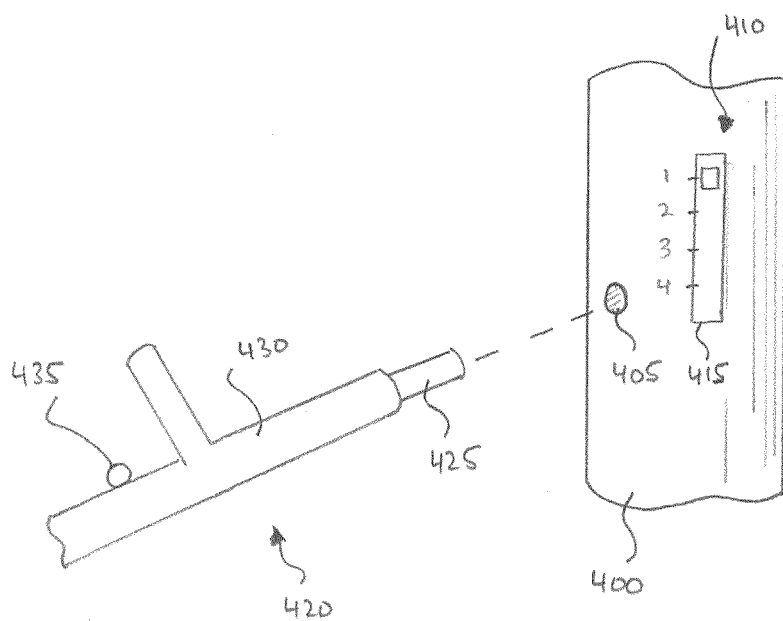


FIG. 4

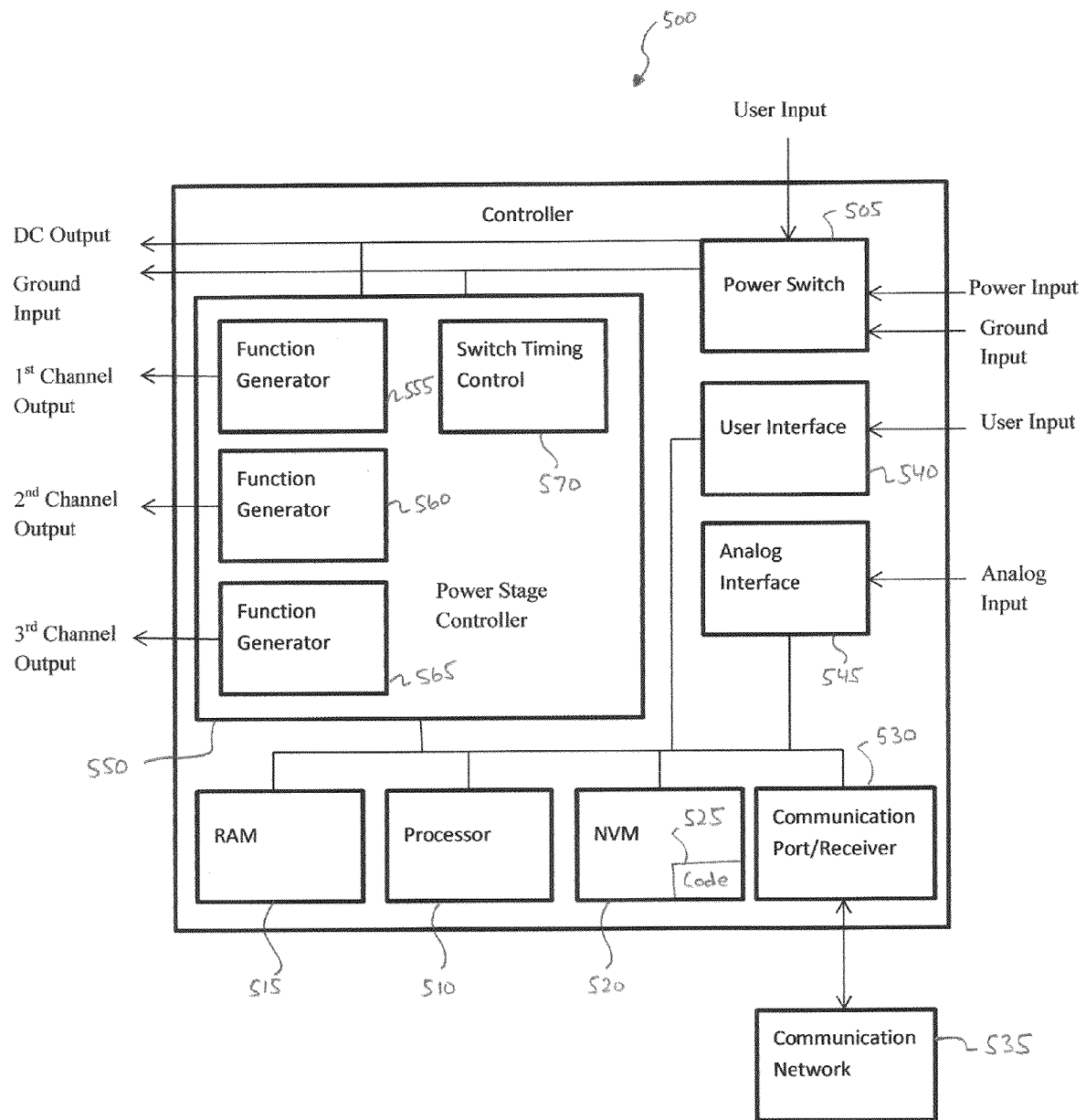


FIG. 5

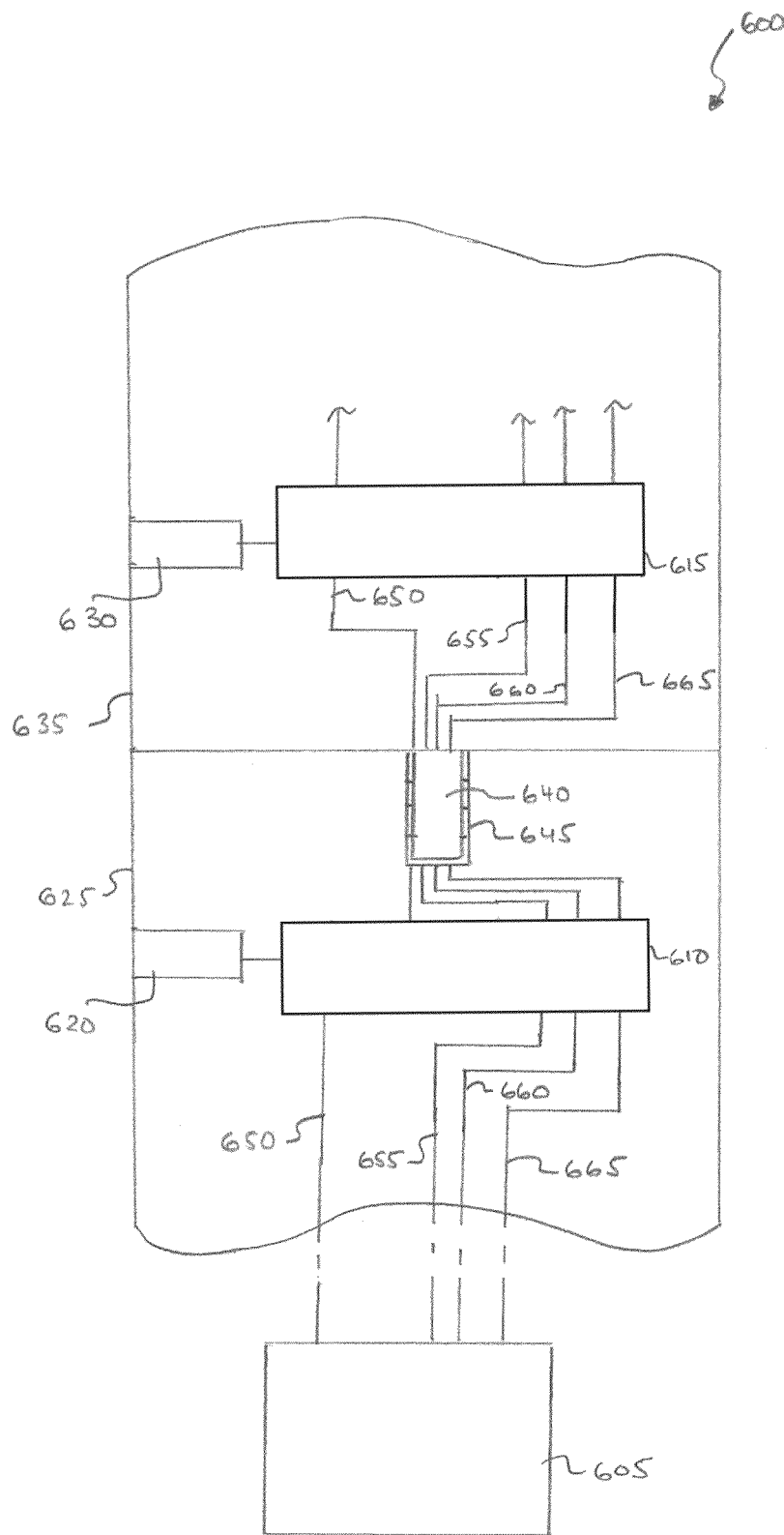


FIG. 6

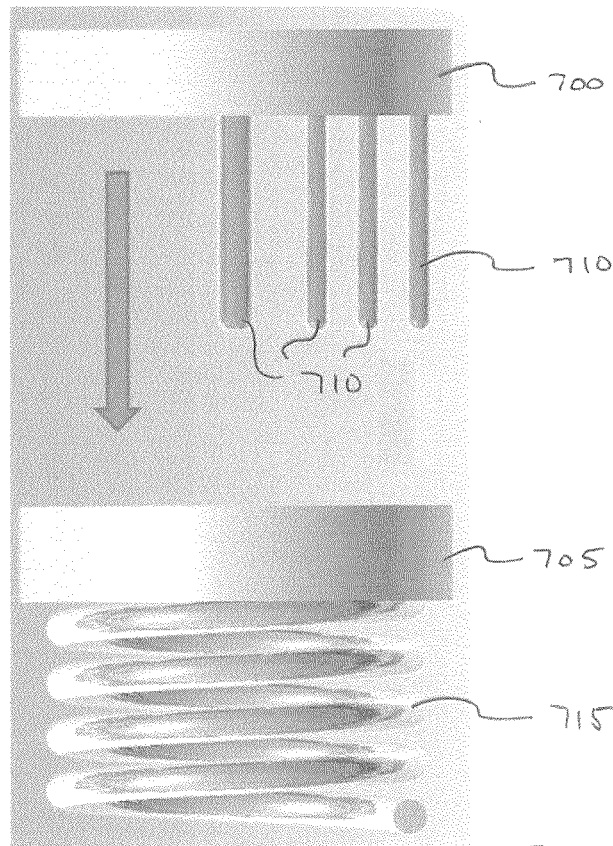


FIG. 7A

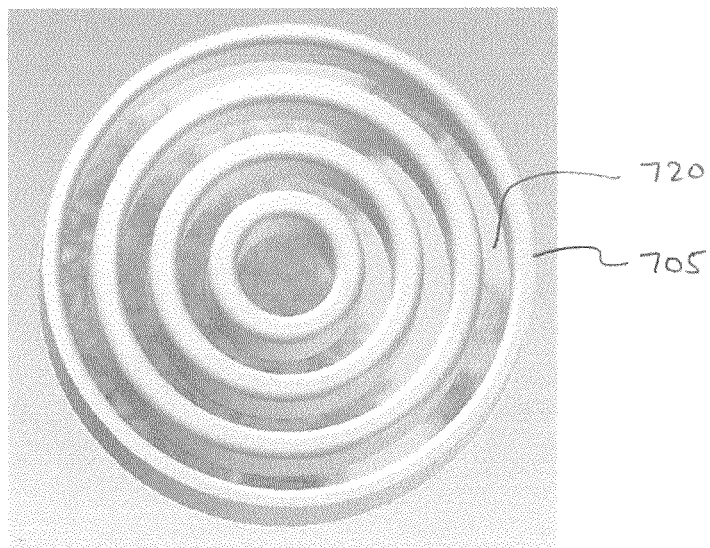
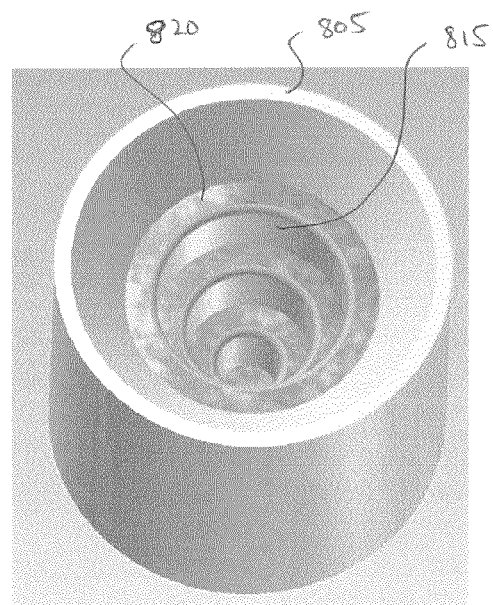
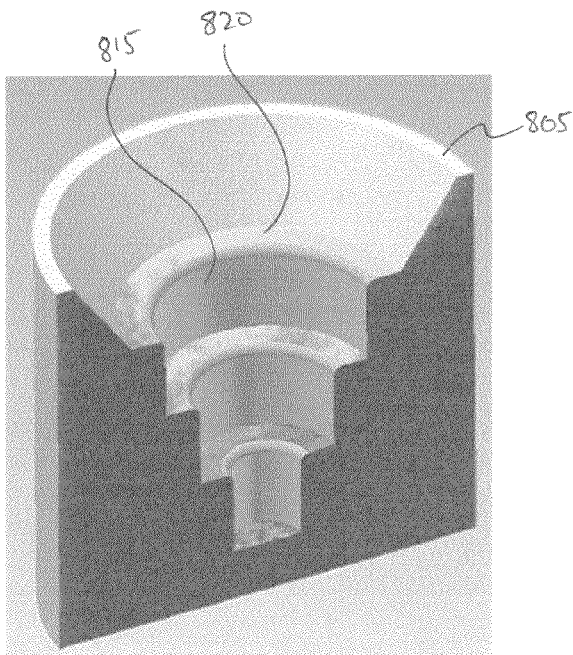
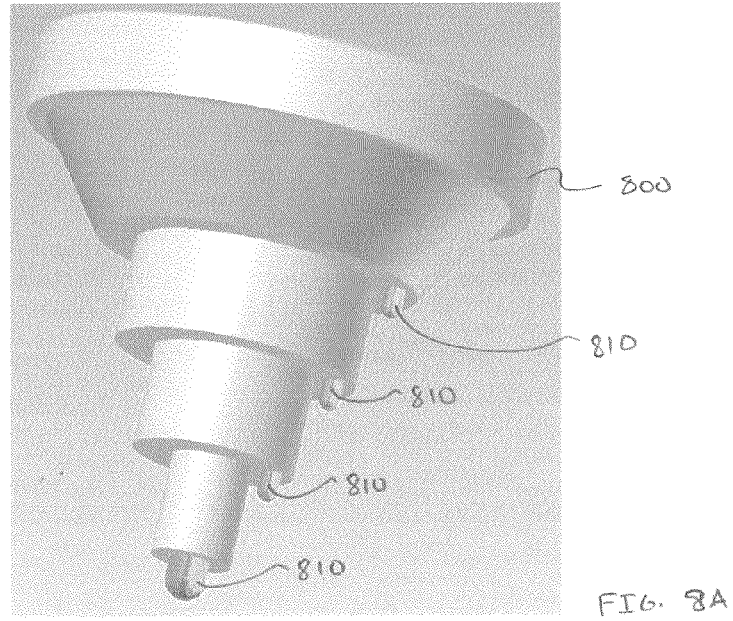
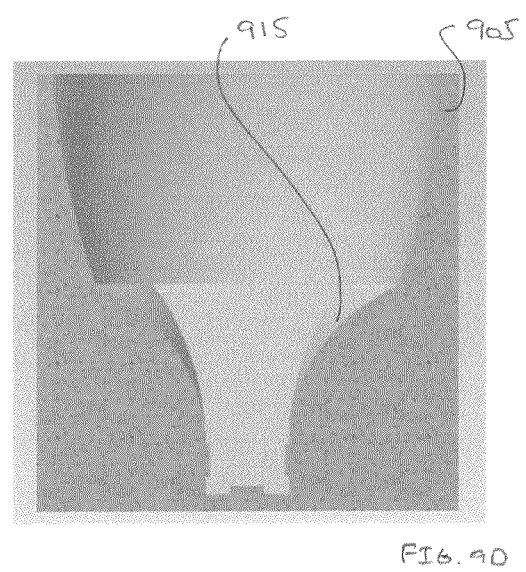
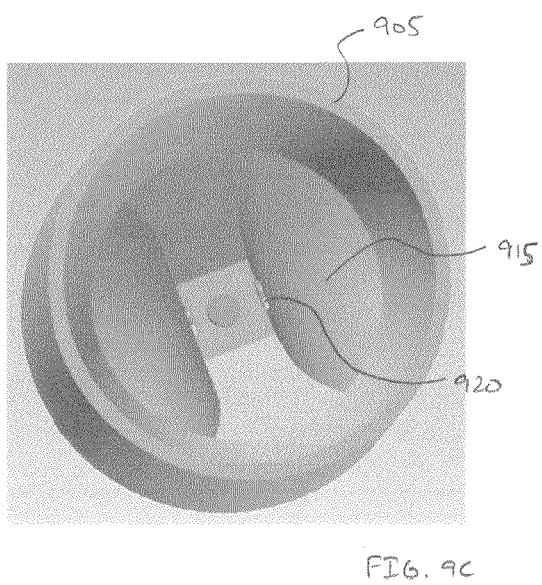
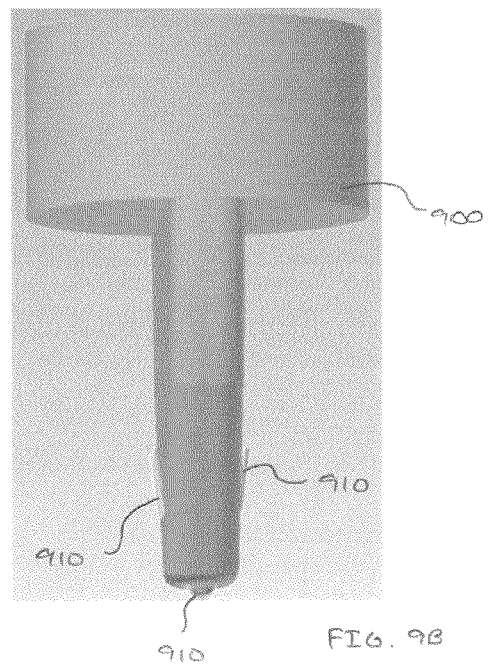
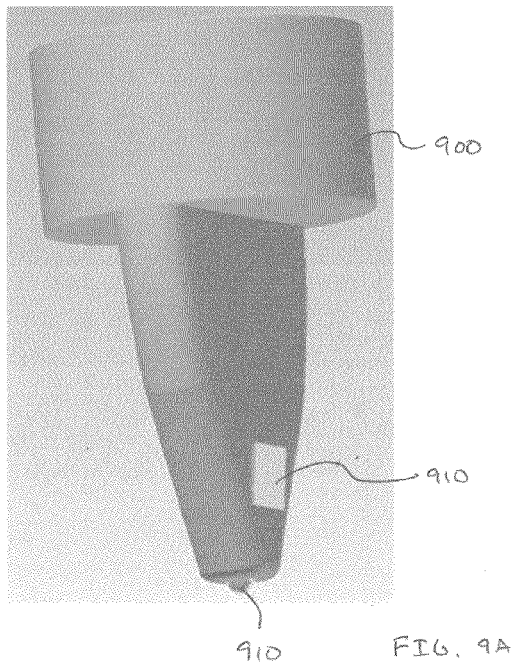


FIG. 7B





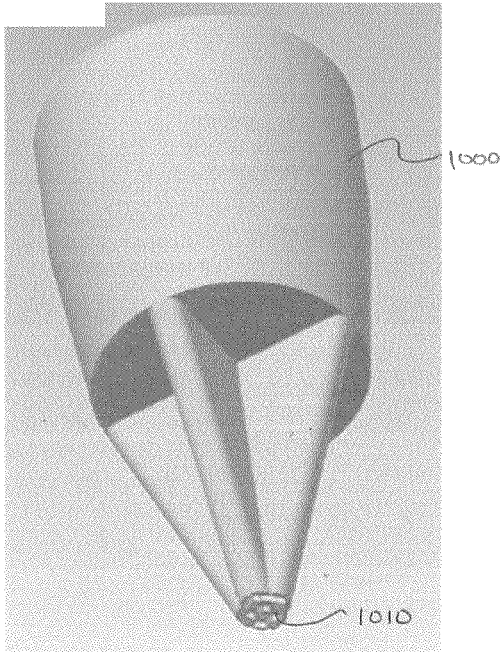


FIG. 10A

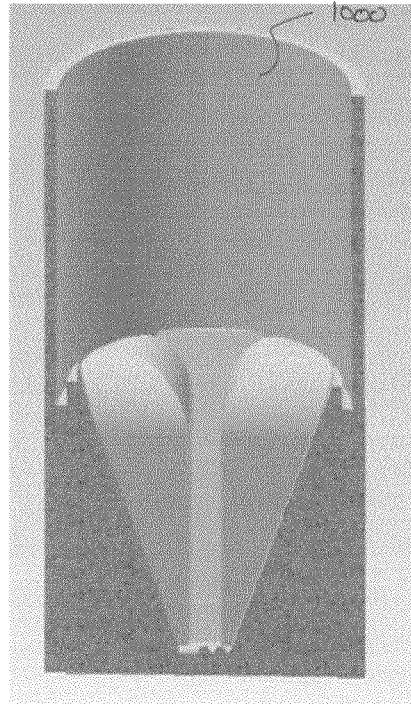


FIG. 10B

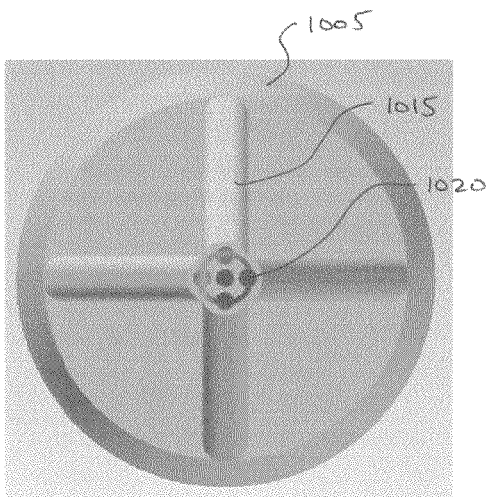


FIG. 10C

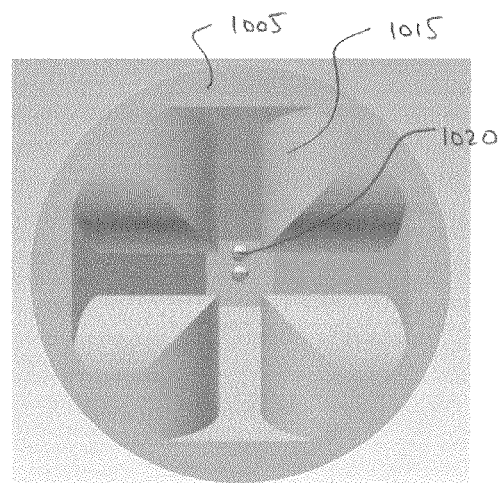


FIG. 10D

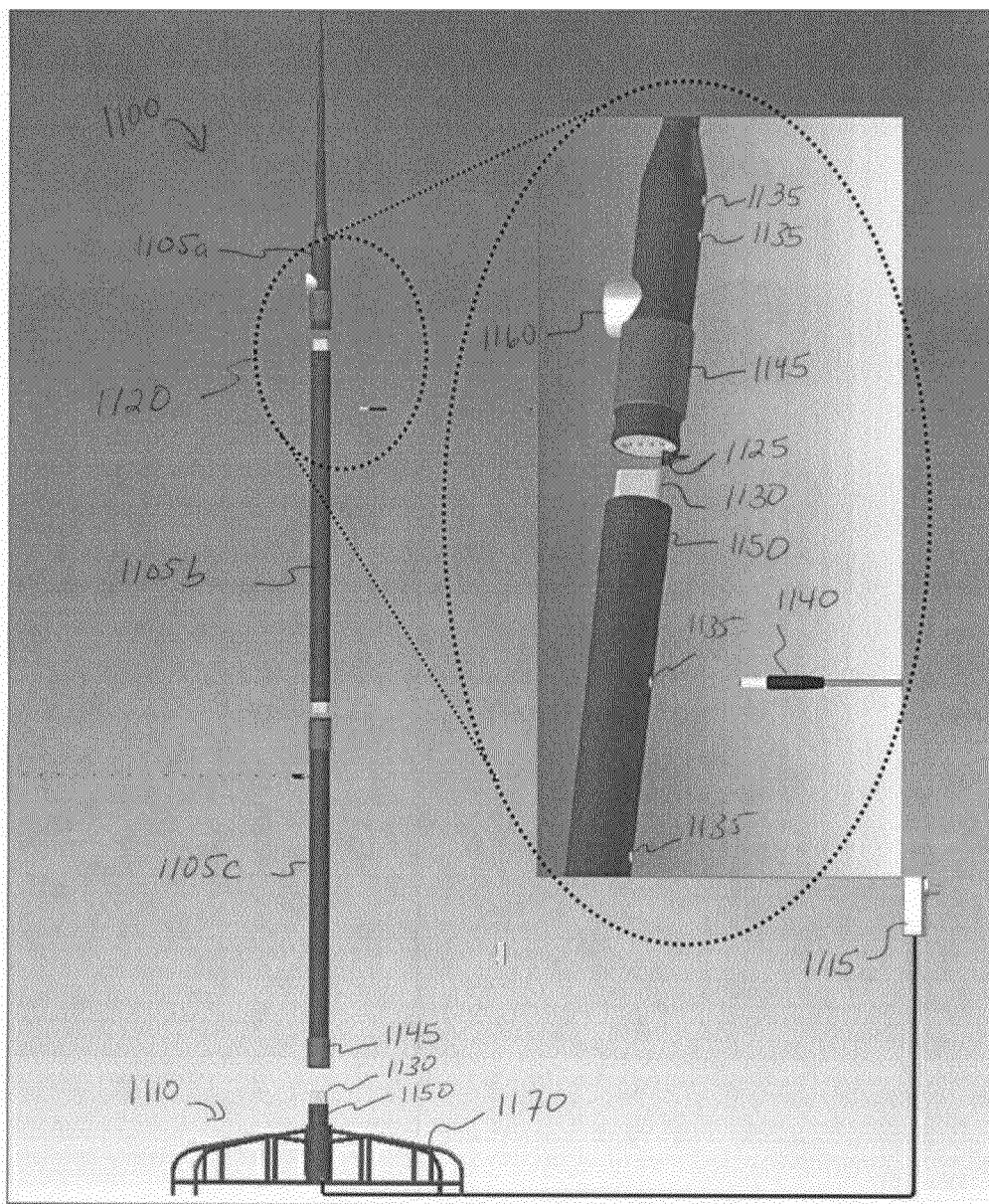


FIG. 11

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ARCHITECTURE FOR ROUTING MULTI-CHANNEL COMMANDS VIA A TREE COLUMN

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a continuation-in-part of U.S. patent application Ser. No. 13/288,114 which is a continuation-in-part of U.S. patent application Ser. No. 12/836,425, now issued as U.S. Pat. No. 8,053,042. This application claims priority to the following applications, each of which is fully incorporated by reference herein:

61/225,258	Artificial Tree Apparatus	Jul. 14, 2009
12/836,425	Artificial Tree Apparatus	Jul. 14, 2010
13/288,114	Artificial Tree Apparatus with Axial Electrical Connectors	Nov. 3, 2011

TECHNICAL FIELD

Various embodiments relate generally to improved coupling arrangements for the trunk portions of artificial trees in which sections may easily connect and/or may carry power and/or any other important electrical information or commands via the tree column.

BACKGROUND

It has become commonplace in both residential and commercial environments to incorporate plants in both indoor and outdoor spaces. Plants can serve various useful purposes, such as for example, providing decoration both for everyday and holiday occasions, providing health benefits through the release of oxygen, as well as creating a more relaxing environment through actual and placebo effects of the plant. In cases where a live plant cannot or is preferred not to be accommodated, artificial plants or trees can be a popular choice. A popular instance in which to use an artificial tree is in the use of an artificial holiday tree. Many people choose to decorate their tree in accordance with the holiday season.

SUMMARY

Apparatus and associated methods may relate to an artificial tree apparatus having a plurality of trunk segments that, upon secure mechanical coupling into a column, couple a plurality of independent information channels and/or command signals via the column. In an illustrative example, one or more branch segments having light emitting devices may be connected to the trunk segments. A plurality of branch segments may receive independent signals transmitted from a control system. In some implementations, some of the signals generated by the control system may include command data associated with a predetermined illumination pattern. In some embodiments, each branch segment load may be independently controlled via a multi-channel arrangement. In various implementations, each trunk segment may include an axial connector that permits adjacent trunk segments to be mechanically coupled from any radial orientation relative to a longitudinal axis of the column.

Various embodiments may achieve one or more advantages. For example, some embodiments may output complex output patterns (e.g., lights, sounds, motions) by coordinated

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modulation of phase, amplitude, and/or waveform command signals conveyed to independent load devices associated with an artificial tree, for example. Some embodiments may permit the user to manually configure each command signal directly at the main controller. In some examples, the user may have the option to manually configure independent loads or branch segments via a control interface disposed in close proximity to an inter-connection point, for example, between the branch segment and the trunk segment. Various embodiments may advantageously provide an improved coupling arrangement for the trunk portions of an artificial tree, for example, in which each section, besides connecting easily, carries current and any other important signal, including but not limited to electrical information or commands, via the tree column. Certain embodiments facilitate simplified assembly and disassembly of the trunk column by introducing self-aligning electro-mechanical interfaces into the trunk segments, which may include multi-channel electromagnetic coupling systems for communicating multiple channels of commands and/or information across the interface between adjacent trunk segments. Various embodiments may advantageously provide high performance multi-channel control capabilities while substantially simplifying and reducing complexity, effort, hassle, and time required to assemble a fully functioning, self-standing display. Moreover, ergonomic safety may be enhanced by eliminating the need to align two bulky objects, and electrical safety hazards may be reduced, for example, by integrating electrical conductors within the tree column.

The details of various embodiments are set forth in the accompanying drawings and the description below. Other features and advantages will be apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts, in an exploded view, an exemplary artificial tree apparatus with multi-channel signals distributed via the tree column.

FIG. 2 depicts exemplary first and second trunk segments longitudinally aligned for connection.

FIG. 3 depicts an exemplary branch segment for coupling to a trunk segment with a user interface.

FIG. 4 depicts another exemplary branch segment for coupling to a trunk segment with a user interface.

FIG. 5 depicts an exemplary controller used in a control system for outputting independent multi-channel signals.

FIG. 6 depicts another exemplary system for processing independent multi-channel signals.

FIGS. 7A-7B depict an exemplary orientation-independent multi-channel signal interface connection assembly.

FIGS. 8A-8C depict another exemplary orientation-independent multi-channel signal interface connection assembly.

FIGS. 9A-9D depict an exemplary self-aligning multi-channel signal interface connection assembly.

FIGS. 10A-10D depict another exemplary self-aligning multi-channel signal interface connection assembly.

FIG. 11 depicts an exemplary multichannel distribution system integrated in a central pole.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

To aid understanding, this document is organized as follows. First, an exemplary artificial tree featuring multi-chan-

nel axial electrical interfaces and multi-channel signal path(s) integrated within the central pole is briefly introduced with reference to FIGS. 1-2. Then, with reference to FIGS. 3-4, exemplary user interfaces that permit selection of a preferred light pattern channel for singular or group of branch segments are described. Next, the discussion turns to an exemplary embodiment of a controller in FIG. 5. Then, with reference to FIG. 6, further explanatory discussion is presented to explain exemplary processing of multi-channel signal(s) received from the controller. Then, with reference to FIGS. 7A-10D, various orientation-independent and self-aligning connection assemblies are illustrated for use with a single or multi-channel artificial tree apparatus. Finally, an exemplary multichannel system is described with reference to FIG. 11.

FIG. 1 depicts, in an exploded view, an exemplary artificial tree apparatus with multi-channel signals distributed via the tree column. An artificial tree apparatus 100 provides decoration and dynamic, complex, time-varying, multi-channel illumination. In an exemplary embodiment, the artificial tree apparatus 100 is in the shape of a Christmas tree, although the loads could be applied to another decoration, edifice, or substrate. By way of example and not limitation, the artificial tree apparatus 100 of this example may be of various heights, such as for example 2, 3, 4, 5, 6, 7, or 8 feet in overall height.

The artificial tree apparatus 100 includes a base 105 for providing self-standing upright support of the artificial tree apparatus 100. In some embodiments, the base 105 may be secured rigidly to a floor surface. In other embodiments, the base 105 may be movable along the floor surface. Although not shown in this example, the base 105 may rotate the tree about its longitudinal axis. In such event, the electrical contact may be maintained, for example, via slip ring contacts, to avoid twisting of an electrical cord.

Extending vertically from the base 105 is a plurality of trunk segments 110, 115, 120, 125. The number of trunk segments 110, 115, 120, 125 may depend upon the overall height preference of the artificial tree apparatus 100. In some exemplary embodiments, only 2-3 trunk segments may be used. In other exemplary embodiments, 4-6 trunk segments may be used to achieve a greater overall height of the artificial tree apparatus 100. The length of each trunk segment 110, 115, 120, 125 may be the same in some exemplary embodiments. The trunk segments 110, 115, 120, 125 may employ a circular cross-section in some exemplary embodiments. The circular cross-section of the trunk segments 110, 115, 120, 125 permits the trunk segments to be connected in any radial orientation relative to the connecting trunk segments 110, 115, 120, 125, that are being connected in a non-radial dependent manner.

Other cross-sectional shapes may provide for a more limited connection arrangement. For example, a square cross-sectional shape of the trunk segments would only permit 4 radially different positions of adjacent-connecting trunk segments. Examples that incorporate orientation-dependent alignment of trunk segments are described with reference, for example, to at least FIG. 2 of U.S. Pat. No. 8,053,042, to Loomis, J., the entire contents of which are incorporated herein by reference.

In another exemplary embodiment, some trunk segments 110, 115, 120, 125 may be shorter or longer than other trunk segments 110, 115, 120, 125 to achieve a desired visual and/or lighting effect. For example, the trunk segments 110, 115, 120, 125 may be assembled in a preferred order of emitted light pattern. Different trunk segments 110, 115, 120, 125 may be pre-programmed (e.g., hard-wired or executing a programmed set of instructions stored on a data store) to output a different predetermined light pattern scheme, for

example. Such schemes may involved a visually perceptible effect based on, for example, a combination of spectral, temporal (e.g., phase, frequency), and modulation waveform differentiations. A first trunk segment may be configured to output green light, a second trunk segment may be configured to output red light, and a third trunk segment may be configured to output blinking white light, for example. The term "light pattern" herein may refer to various lighting effects, such as for example the light color, the light hue, the light increasing or decreasing brightness or intensity, the light on/off sequence, such as blinking fast, blinking slow, or other lighting effects such as simply turning the light on or off.

As shown, each trunk segment 110, 115, 120, 125 includes an axial electrical connector 130 configured as a plug to mate with another axial electrical connector 135 configured as a socket. In assembly, the trunk segments 110, 115, 120, 125 and respective axial electrical connectors 130, 135 longitudinally align when being connected. The plug axial electrical connector 130 may be oriented in any radial position relative to the socket axial electrical connector 135 when connecting trunk segments 110, 115, 120, 125, thus being non-radial dependent. By permitting independent and free rotation of the axial electrical connectors 130, 135 during assembly, the artificial tree apparatus 100 becomes easy and quick to assemble. Furthermore, the axial symmetry permits the user a degree of freedom to independently adjust the relative angle between any of the segments 110-125, as may be desired by the user.

Extending from each trunk segment 110, 115, 120, 125 are one or more branch segments 140, 145, 150, 155. In an exemplary embodiment, the branch segments 140, 145, 150, 155 are shaped to resemble tree limbs. For example, the branch segments 140, 145, 150, 155 may be shaped to resemble Pine tree boughs.

In the depicted embodiment, each branch segment 140, 145, 150, 155 includes one or more integral light emitting devices 160, 165, 170, 175 for emitting a light pattern. In some embodiments, the light emitting devices 160, 165, 170, 175 may include light emitting diodes (LEDs). In some embodiments, the light emitting devices 160, 165, 170, 175 may include incandescent bulbs. Each load of the light emitting devices 160, 165, 170, 175 may be configured to emit a predetermined light patterns that may be different (e.g., independent) with respect to the other light emitting devices 160, 165, 170, 175 on the same or different branch segment 140, 145, 150, 155. For example, a first group of lighting devices 160 on a first group of branch segments 140 may output a slow blinking light pattern in a red color. A second group of lighting devices 165 on a second group of branch segments 145 may output a fast blinking light pattern in a blue color. A third group of lighting devices 170 on a third group of branch segments 150 may output an alternately increasing and decreasing intensity green light pattern. A fourth group of lighting devices 175 on a fourth group of branch segments 155 may output a non-periodic (e.g., constant) white light pattern.

In the case that one or more light emitting devices 160, 165, 170, 175 or strings of light emitting devices burn-out, the branch segment 140, 145, 150, 155 may be removed from the trunk segment 110, 115, 120, 125 and a replacement branch segment may be connected.

The artificial tree apparatus 100 includes a control system 180 to generate and transmit command signals to the light emitting devices 160, 165, 170, 175. In some embodiments, the control system 180 may include a controller located at (or within) the base 105 of the artificial tree apparatus 100. The command signals may be sent through internal wiring extend-

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ing within the trunk segments **110**, **115**, **120**, **125** and the branch segments **140**, **145**, **150**, **155** to the light emitting devices **160**, **165**, **170**, **175**. The axial electrical connectors **130**, **135** provide a pathway between trunk segments **110**, **115**, **120**, **125** for the command signals, which may include power, data, and/or control signals in analog and/or digital formats. In some exemplary embodiments, the control system **180** is located within the base **105** of the artificial tree apparatus **100**. The control system **180** permits independent operation of the light emitting devices **160**, **165**, **170**, **175**. In an exemplary embodiment, the control system **180** generates and transmits a first command signal that is transmitted to a first group of light emitting devices **160** upon the first branch segments **140** and generates a separate and distinct command signal that is transmitted to a second group of light emitting devices **165** upon the second branch segments **145**.

A power cord **185** and plug **190** is shown to provide power to the light emitting devices **160**, **165**, **170**, **175** and to the control system **180**. In an exemplary embodiment, AC power received by the power cord **185** and plug **190** may be converted to low voltage DC power and then delivered to the light emitting devices **160**, **165**, **170**, **175**. The low voltage DC power causes the light emitting devices **160**, **165**, **170**, **175** to illuminate at the pre-determined light pattern. In other exemplary embodiments, a battery pack may be provided to power the control system **180** and/or the light emitting devices **160**, **165**, **170**, **175**.

The artificial apparatus **100** provides a coupling arrangement of the trunk segments **110**, **115**, **120**, **125** to permit independent relative rotation of adjacent connecting trunk segments **110**, **115**, **120**, **125** thus permitting easy connection in that the adjacent trunk segments **110**, **115**, **120**, **125** may be connected at and operate from any radially angular position relative to each other and to the longitudinal axis. Additionally, the coupling arrangement provides for electrical current and other important command information to be carried via internal pathways and connectors **130**, **135** extending within and from each of the trunk segments **110**, **115**, **120**, **125**.

FIG. 2 depicts exemplary first and second trunk segments longitudinally aligned for connection. A first trunk segment **200** is configured to electrically and mechanically attach to a second trunk segment **205** while permitting the first trunk segment **200** to be positioned at any radial angle (e.g., non radial dependent) relative to the second trunk segment **205** and still employ a secure electrical and mechanical connection. The trunk segments are substantially aligned and symmetric with respect to a longitudinal axis. For example, the first trunk segment **200** may be positioned at a 0 degree radial angle relative to a reference point upon the second trunk segment **205**. In another example, the first trunk segment **200** may be positioned at a 90 degree radial angle relative to the same reference point upon the second trunk segment **205** and still employ the same electrical and mechanical connection as the relative 0 degree angle connection.

In the depicted example, the first trunk segment **200** includes a hollow sleeve **210** extending from one end. The sleeve **210** extends along a longitudinal axis of the first trunk segment **200**. Extending from the first trunk segment **200** within the sleeve **210** is a first axial electrical connector **215** in the shape of a (male) plug. The first axial electrical connector **215** is concentric with the sleeve **210** to permit free radial rotation about the longitudinal axis and relative to the second trunk segment **205** during or after attachment. The first axial electrical connector **215** includes a plurality of contacts **220**, **225**, **230**, each separated by an insulator **235**. Each contact **220**, **225**, **230** may be configured to carry an independent electrical signal. In an exemplary embodiment, a first contact

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220 is configured to carry a power signal, a second contact **225** is configured for ground (e.g., signal return), and a third contact **230** is configured to carry an electrical command signal representative of a light pattern.

The longitudinally recessed location of the first axial electrical connector **215** within the sleeve **210** protects the first axial electrical connector **215** from damage during assembly, disassembly, and storage of the trunk segments **200**, **205**, and ensures proper coaxial alignment of the axial electrical connector **215** prior to engagement. In addition, the overlapping stability of the cylindrical walls of the corresponding trunk segments **200**, **205** provides greater strength and stability to the coupled trunk segments **200**, **205** of the artificial tree apparatus when installed.

The second trunk segment **205** includes a diametrically recessed portion **240** along an end which has a lesser outer diameter than the inner diameter of the sleeve **210** of the first trunk segment **200** such that the recessed portion **240** is received within the sleeve **210**. Extending inwardly from the end of the second trunk segment **205** is a second axial electrical connector **245** in the shape of a (e.g., female) socket for receiving the first axial electrical connector **215**. The first axial electrical connector **215** of the first trunk segment **200** is recessed some distance from the end of the first trunk segment **200** and within the internal cavity of the sleeve **210** so that the first trunk segment **200** can slide onto the recessed portion **240** of the second trunk segment **205** and engage the second trunk segment **205** to mate the first axial electrical connector **215** with the second axial electrical connector **245** of the second trunk segment **205**. The reduced diameter recessed portion **240** of the second trunk segment **205** can freely rotate within the sleeve **210** of the first trunk segment **200** even when the first and second axial electrical connectors **215**, **245** are fully coupled together.

Like the first axial electrical connector **215**, the second axial electrical connector **245** includes a corresponding plurality of contacts **250**, **255**, **260** to electrically connect with respective contacts **220**, **225**, **230** of the first axial electrical connector **215**. The provision of single or multiple channels carried on the single axial plug of the first axial electrical connector **215** and the corresponding axial socket of the second axial electrical connector **245** enables free rotation of the axial electrical connectors **235**, **245**, obviating the need to rotationally align the trunk segments **200**, **205** prior to assembly of the artificial tree apparatus.

In various embodiments, releasable galvanic communication may be made between corresponding contact terminals of the connectors **215**, **245** by, for example, by employing compliant contacts that provide adjustable radial depth to accommodate axial connection and disconnection.

FIG. 3 depicts an exemplary branch segment for coupling to a trunk segment with a user interface. A trunk segment **300** is shown having a user interface **305** with a first radial receptacle **310**, a second radial receptacle **315**, and third radial receptacle **320**. The first radial receptacle **310** may connect to a first signal wire internal to the trunk segment **300** that is configured to carry a first electrical command signal. The second radial receptacle **315** may connect to a second signal wire internal to the trunk segment **300** that is configured to carry a second electrical command signal. The third radial receptacle **320** may connect to a third signal wire internal to the trunk segment **300** that is configured to carry a third electrical command signal. The electrical command signals may be different from each other to represent different light patterns. Each branch segment **325** may be connected to a preferred radial receptacle **310**, **315**, **320** thus permitting different branch segments **325** to emit different light patterns by

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the respective electrical command signals. In some implementations, the radial receptacles **310-320** may carry a plurality of signals, for example, including power and at least one data signal containing encoded information associated with a command signal for modulating the load output intensity, for example.

For example, the first electrical command signal may be representative of a first light color, the second electrical command signal may be representative of a second light color, and the third electrical command signal may be representative of a third light color. In another exemplary embodiment, the first electrical command signal may be representative of a blinking light, the second electrical command signal may be representative of a solid light, and the third electrical command signal may be representative of a modulating light.

In the depicted example, a radial plug **330** extends from the branch segment **325**. The branch segment **325** may include a branch member **335** to mimic the shape of a tree branch. The branch segment **325** has one or more light emitting devices **340**. The radial plug **330** is connected via insertion to the user-selected radial receptacle **310, 315, 320** that is configured to emit the preferred electrical command signal. If a different electrical command signal is later preferred, the radial plug **330** may be removed from the radial receptacle **310, 315, 320** currently in use and reinserted into a different radial receptacle **310, 315, 320**. If all radial receptacles **310, 315, 320** corresponding to the same electrical command signal on each trunk segment **300** are desired to be altered to correspond to a different electrical command signal, a control system may be configured to output a different electrical command signal to the corresponding group of radial receptacles **310, 315, 320**. In some exemplary embodiments, the user interface **305** and radial receptacles **310, 315, 320** form a portion of the control system.

FIG. 4 depicts another exemplary branch segment for coupling to a trunk segment with a user interface. A trunk segment **400** is shown having a radial receptacle **405** and a user interface **410** comprising a multi-position control switch **415**. As shown, the control switch **415** includes a first position, a second position, a third position, and a fourth position. The first position may be representative of a first electrical command signal, the second position may be representative of a second electrical command signal, the third position may be representative of a third electrical command signal and the fourth position may be representative of a fourth electrical command signal.

A branch segment **420** having a radial plug **425** is aligned with the radial receptacle **405**. The branch segment **420** includes a branch member **430** for carrying one or more light emitting devices **435**. The radial plug **425** is connected via insertion to the radial receptacle **405**. The control switch **415** position is adjusted to output a corresponding electrical command signal to the light emitting devices **435** upon the branch segment **420**. If the light pattern is desired to be changed, the control switch **410** may be adjusted to output a different electrical command signal. If none of the electrical command signals available via the control switch **410** positions are desired, a control system may be configured to correspond one or more of the control switch **410** positions with an alternative electrical command signal corresponding to a different light modulation or pattern. In some exemplary embodiments, the user interface **410** and radial receptacle **405** may form a portion of the control system. In various embodiments, the user interface **415**, alone or integrated with a controller, may advantageously be disposed at a convenient height for access by a user in a standing position, which may be, for example, one meter or more above the floor on which

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the base is resting. In some embodiments, the controller may be hidden by decorative or ornamental items on or proximate the controller housing.

FIG. 5 depicts an exemplary controller used in a control system for outputting independent multi-channel signals. A controller **500** is shown which may form an entire or a portion of a control system used to generate, process, and/or transmit one or more channels of command signals for distribution via the central trunk segments to loads, which may include light strings capable of illuminating light patterns in response to the command signals. The controller **500** includes a power input and a ground input that may lead to a power switch **505** controlled by user input.

In various implementations, the power input signal may be AC or DC. If required, the controller **500** may include an AC to DC converter to convert the input power. Further power conditioning may be incorporated, for example, to provide appropriate filtering, power factor correction, electromagnetic interference suppression/mitigation, and/or attenuation or boosting, as appropriate for the application. In some embodiments, outputs of the controller may be configured to regulate or limit current and/or voltage supplied to a particular load. In some embodiments an upstream controller **500** may control operation of the power switch **505**.

Output from the controller **500** includes a DC output and a ground output. In some embodiments, the DC output may pass-through and be substantially the same amplitude as the Power Input (DC) voltage such that the DC passes-through the controller **500** without being substantially attenuated. In some embodiments, the power switch **505** may be omitted.

The controller **500** depicted in this example is programmable and includes a processor **510** (e.g., CPU), random access memory (RAM) **515**, non-volatile memory (NVM) **520** which may have embedded code **525**, and a communications port **530**. The processor **510** may receive and execute the code **525** to perform various digital or analog control functions. The processor **510** may be a general purpose digital microprocessor **510** which controls the operation of the controller **500**. The processor **510** may be a single-chip processor **510** or implemented with multiple components. Using instructions retrieved from memory, the processor **510** may control reception and manipulations of input data and the output data or excitation signals. RAM may be used by the processor **510** as a general storage area and as scratch-pad memory, and can also be used to store input data and processed data.

The exemplary controller **500** also includes a user interface **540** controlled by user input and an analog interface **545** controlled by analog input. The user interface **540** may include dials, such as for example timing dials, frequency dials, or amplitude control dials. The user interface **540** may include switches or control buttons, such as for example amplitude changing controls, channel changing controls, or frequency changing controls. The switches or control buttons may correspond to various light patterns that may involve, for example, light colors, modulation patterns (e.g., pulsed, triangular, sinusoidal, or rectangular waveforms), light intensities, or light blinking rates. The user interface **540** and the analog interface **545**, as well as the processor **510**, memory, and communications are connected to a control module **550**.

A communications network **535** may communicate with the communications port **530** and may be utilized to send and receive data over a network **535** connected to other controllers **500** or computer systems. An interface card or similar device and appropriate software may be implemented by the processor **510** to connect the controller **500** to an existing network **535** and transfer data according to standard protocols. The

communications network **535** may also communicate with upstream or downstream controllers **500**, such as for example to activate or deactivate upstream or downstream controllers **500**. In some embodiments, the communications network **535** may be suited for routing master-slave commands to or from the downstream controller **500**. In the embodiment, the controllers **500** may include suitable circuitry for interpreting the master-slave command. Commands sent to upstream or downstream controllers **500** may be sent through power line carrier modes, optical (e.g., infrared, visible), sound (e.g., audible, ultrasonic, subsonic modulation), or wireless (e.g., Bluetooth, Zigbee) modes, for example.

The exemplary control module **550** includes a plurality of function generators **555**, **560**, **565** each for outputting one or more predetermined or user-configured waveforms to a corresponding channel. In one mode, the function generators **555**, **560**, **565** may operate independently of one another. In a second mode, the function generators **555**, **560**, **565** may operate with, for example, different temporal, phase shift, or waveforms aspects. In some examples, some or all of the function generators **555-565** may be synchronized to each other, or to external clock source signal, for example. The function generators **555**, **560**, **565** may receive pre-stored data for outputting predetermined waveforms or may receive user-configured data from user input to generate unique and customizable waveforms. In some embodiments, the waveforms generated may be electrical waveforms which control and regulate output lumens from one or more lights upon a light string. In some examples, the control module **550** may also include a switch timing control **570** which may use a duty cycle to generate control signals for use by the function generators **555**, **560**, **565**. In some embodiments, the control signals may be timed to produce predetermined current waveforms at predetermined frequencies or intervals. By way of example and not limitation, exemplary composite effects may include, but are not limited to, walking, waterfall, random, or a combination of such effects.

In some embodiments, the waveforms generated by the function generators **555**, **560**, **565** may comprise one or more frequencies. In some embodiments, the waveforms generated may cause a blinking effect among the connected lights. In some embodiments, the waveforms generated may cause a steady-on effect among the connected lights. In some embodiments, the waveforms generated may cause a dimming effect among the connected lights. In some embodiments, the waveforms generated may cause a dimming effect followed by a steady-on effect among the connected lights. In some embodiments, the waveforms generated may cause a blinking effect followed by a dimming effect followed by a steady-on effect among the connected lights.

FIG. 6 depicts another exemplary system for processing independent multi-channel signals. A control system **600** includes a main controller **605** and a plurality of multiplexers **610**, **615** that may receive addressed command signals from the main controller **605** and output electrical command signals, for example as via a buffer or a pass-through. In the depicted example, the first multiplexer module **610** and associated circuitry is electrically connected to radial receptacles **620** on a first trunk segment **625**. A second multiplexer module **615** and associated circuitry is electrically connected to a radial receptacle **630** on a second trunk segment **635**. The trunk segments **625**, **635** may be electrically connected via the exemplary axial electrical connectors **640**, **645**.

Each multiplexer **610**, **615** is in signal communication with the controller **605** via a command wire **650** and a plurality of channel wires **655**, **660**, **665**. The command wires **650** may carry an electrical command signal indicative of a command

for a specific addressed multiplexer **610**, **615** to read and transmit a specific channel wire **655**, **660**, **665**. Power and ground wires may also be incorporated within one or more of the command or channel wires **650**, **655**, **660**, **665**, or incorporated as stand-alone wires to provide power to the light emitting devices and internal circuitry. The wires and circuitry are located internal to the trunk segments **625**, **635** and may be internal or be routed along axial electrical connectors **640**, **645** connecting the trunk segments **625**, **635**.

In some implementations, the command wire **650** may also serve as a power delivering signal from a low impedance source so as to deliver operating voltage and current to supply one or more load devices. In such examples, to provide for communication over the power line **650**, the multiplexer modules **610**, **615** may each be equipped with frequency selective receivers that can detect demodulate command signals that are modulated on top of the power line power delivering signal, which may be low voltage DC, for example, or 60 Hz AC, for example, as carried on the command wire **650**. In various examples, a suitable frequency selective receiver may include an analog filter, a digital filter implemented in hardware, a digital filter implemented in software, or a combination of these, to selectively detect and extract a modulated command signal on the carrier power signal. Various modulation schemes may be used, including but not limited to phase, frequency, or amplitude modulation.

Each multiplexer **610**, **615** may be assigned a predetermined unique address for selectively determining which signal commands to react to. For example, the first multiplexer **610** may have address 0001 and the second multiplexer **615** may have address 0002. Further, each channel wire **655**, **660**, **665** may have a distinct address, such as "A", "B", and "C" for example. In an exemplary embodiment, the main controller **605** may send a serial command signal along the command wire **650**, such as 0001A0002B for example. The command signal may be interpreted by the multiplexer 0001 illustrated as the first multiplexer **610** to read channel wire "A" illustrated as wire **655** and transmit the respective command signal on wire "A" to the connected light emitting devices since address "A" follows the address of the first multiplexer **610**. Since channel address "B" follows the multiplexer address 0002 illustrated as multiplexer **615**, the second multiplexer **615** may be programmed to read channel wire "B" illustrated as wire **660** and transmit the respective electrical signal carried on channel wire "B" to the connected light emitting devices. Accordingly, some embodiments of a control scheme may dynamically control the routing of signals on any of wires **655-665** to any selected load, such as the loads connected to any selected one of the radial receptacles **620**, **630**. Such control schemes may be implemented by operation of a controller, an example of which is described with reference to FIG. 5.

If a manual or automatic preferred channel change were made to one or more of the multiplexer **610**, **615** or main controller **605**, the main controller **605** may be configured to send out an electrical command signal referencing only the multiplexer **610**, **615** that was changed. For example, if the second multiplexer **610** were changed to read and transmit channel "C" illustrated by wire **665** via a control switch or other adjustment device, the main controller **605** may transmit an electrical command signal having data 0002C. Since the electrical command signal does not reference multiplexer 0001, the first multiplexer **610** ignores the command and the command is only read and acted upon by the second multiplexer **615** addressed 0002.

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Various embodiments include exemplary addressing schemes that may be illustrative of the flexible configurations achievable with a multi-channel system with signal distribution in a trunk signals.

In some implementations, information and/or command signals may be conveyed axially via an optical path. In some examples, information and/or command signals may be coupled between trunk segments using galvanically-isolated electrical ports, for example, formed of magnetic flux coupling (e.g., transformer coupling), capacitive coupling, optical coupling, either alone or in some combination.

FIGS. 7A-7B depict an exemplary orientation-independent multi-channel signal interface connection assembly. A connection assembly includes a first connector 700 and a second connector 705. The first connector 700 and the second connector 705 may be formed integrally with the trunk segments and/or the branch segments as described herein to permit connection of trunk segments and/or branch segments in any radial orientation relative to each other. Also shown are a series of first electrical connectors 710 extending from the first connector 700 and a second electrical connector 715 formed within the second connector segment 705. The first electrical connectors 710 may be formed of a male-plug type and the second electrical connector 715 may be formed of a female plug type. In some embodiments, the connectors 710 may be spring-based pins that can adjust to small imperfections in the depth of the coupling connection to between the connector 705 and the connector 715.

The second electrical connector 715 may include an electrically conductive medium 720 for electrically receiving the first electrical connectors 710 and permitting the first electrical connectors 710 to be received within the second electrical connector 715 in any radial orientation. As seen in the top view of the connector 705 shown in FIG. 7B, axially symmetric concentric conductive rings 720 are separated by axially-symmetric concentric non-conductive separator rings. In making an electrical mating, a distal tip of each of the connectors 710 fits within or between adjacent separator rings to substantially prevent electrical shorting.

In some embodiments, the conductive rings 720 may be formed of a conductive gel substance, or a conductive metal (e.g., by way of example and not limitation, copper, nickel, brass, gold or a combination thereof). In some embodiments, each first electrical connector 710 may transmit a different electrical signal.

FIGS. 8A-8C depict another exemplary orientation-independent multi-channel signal interface connection assembly. FIG. 8A depicts an exemplary first connector 800. FIG. 8B and FIG. 8C depict an exemplary sectional view and an exemplary upper perspective view of a second connector 805. The first connector segment 800 and the second connector segment 805 may be formed integrally with the trunk segments and/or the branch segments, respectively, as described herein to permit connection of trunk segments and/or branch segments in any radial orientation relative each other. Also shown are a series of first electrical connectors 810 extending from the first connector segment 800 and a second electrical connector 815 formed within the second connector segment 805. The first electrical connectors 810 may be formed of a male-plug type and the second electrical connector 815 may be formed of a female plug type.

The second electrical connector 815 may include an electrically conductive medium 820 for electrically receiving the first electrical connectors 810 and permitting the first electrical connectors 810 to be received within the second electrical connector 815 in any radial orientation. In some embodiments, the conductive medium 820 may be formed of a con-

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ductive gel substance. In some embodiments, each first electrical connector 810 may transmit a different electrical signal (e.g., power, commands, information), such as a different signal channel.

FIGS. 9A-9D depict an exemplary self-aligning multi-channel signal interface connection assembly. FIG. 9A and FIG. 9B depict an exemplary first connector 900 in plan and perspective side views. FIG. 9C and FIG. 9D depict an exemplary top view and an exemplary sectional view of a second connector 905. The first connector segment 900 and the second connector segment 905 may be formed integrally within the trunk segments and/or the branch segments as described herein to permit connection of trunk segments and/or branch segments in a self-aligning manner. Also shown are a series of first electrical connectors 910 extending from the first connector segment 900 and a guide 915 leading to a series of second electrical connectors 920 formed within the second connector segment 905. The first electrical connectors 910 may be formed of a male-plug type and the second electrical connector 920 may be formed of a female plug type.

The guide 915 forces the male end of the first connector segment 900 to be rotated towards a pre-determined angle with respect to a longitudinal axis when being inserted within the second connector segment 905. The guide 915 has curved or angled interior edges so that the first connector segment 900 slides into the second connector segment 905 smoothly and without obstruction. The second electrical connector 920 may comprise an electrically conductive medium 920 for electrically receiving the first electrical connectors 910 and permitting the first electrical connectors 910 to be received within the second electrical connector 920. In some embodiments, the conductive medium 920 may be a conductive gel substance. In some embodiments, each first electrical connector 910 may transmit a different electrical signal.

FIGS. 10A-10D depict another exemplary self-aligning multi-channel signal interface connection assembly. FIG. 10A and FIG. 10B depict an exemplary first connector 1000 in a side perspective view and a sectional view. FIG. 10C and FIG. 10D depict an exemplary bottom view and an exemplary top view of a second connector 1005. The first connector segment 1000 and the second connector segment 1005 may be formed integrally with the trunk segments and/or the branch segments as described herein to permit connection of trunk segments and/or branch segments in a self-aligning manner. Also shown are a series of first electrical connectors 1010 extending from the first connector segment 1000 and a guide 1015 leading to a series of second electrical connectors 1020 formed within the second connector segment 1005. The first electrical connectors 1010 may be formed of a male-plug type and the second electrical connector 1020 may be formed of a female plug type.

The guide 1015 forces the male end of the first connector segment 1000 to be rotated towards a pre-determined rotation when being inserted within the second connector segment 1005. The guide 1015 has curved or angled interior edges so that the first connector segment 1000 slides into the second connector segment 1005 smoothly and without obstruction. The second electrical connector 1020 may comprise an electrically conductive medium 1020 within for electrically receiving the first electrical connectors 1010 and permitting the first electrical connectors 1010 to be received within the second electrical connector 1020. In some embodiments, the conductive medium 1020 may be a conductive gel substance. In some embodiments, each first electrical connector 1010 may transmit a different electrical signal.

FIG. 11 depicts an exemplary multichannel distribution system integrated in a central pole. As depicted, a multichan-

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nel distribution system **1100** includes pole sections **1105 A**, **B**, **C**, through which multichannel signal conductors are routed from a base **1110**. Extending from the base **1110** is a signal conductor coupled to an interface **1115**. The signal conductor between the base **1110** and the interface **1115** may conduct, for example, power and/or one or more channels of information signals.

The pole section **1105**, couples to the pole section **1105 B** via an interface **1120**, which is shown in the magnified view to reveal additional details. Similarly, the pole sections **1105 B** couples to the pole section **1105 C**, and the pole section **1105 C** couples to the base **1110** via interfaces substantially similar to the interface **1120**.

In the magnified view of the interface **1120**, the interface **1120** includes a multi-channel socket **1125** to receive and provide signal communication to corresponding channels in a plug **1130**. When mated, the multi-channel signals may communicate to radial ports **1135** distributed along the length of the pole sections **1105 A-C**. The radial port **1135** is depicted in this example as receiving a radial plug assembly **1140**, which may be connected to a load and/or a single or multi-channel signal source.

In the depicted example, adjacent pole sections may be securely coupled by a collar **1145** engaging threads **1150**. Also in the depicted example the pole section **1105 A** includes an output connector **1160** at which some or all of the multi-channel signals may be made available to an external load device and/or a controller. In various embodiments, one or more of the output connectors **1160** may be made available, for example, within the base **1110** and/or any of the other pole sections **1105**.

Although various embodiments have been described with reference to the Figures, other embodiments are possible. For example, the axial electrical connectors may be configured in other structural shapes. A first axial electrical connector may be configured in the shape of a concentric ring extending along an outside of a first trunk segment and beyond an end of the first trunk segment. A corresponding end of a second trunk segment may include an axial electrical connector formed into the end for being received by the first axial electrical connector in an overlapping manner.

In an exemplary embodiment, each branch segment may be attached separately to the trunk segments during assembly of the artificial tree apparatus in some exemplary embodiments. In other exemplary embodiments, one or more of the branch segments may be pre-attached to the trunk segments to lessen assembly time of the artificial tree apparatus. In some exemplary embodiments, the branch segments may be pivotally attached to the trunk segments such that the branch segments are folded up during storage to minimize an overall surface area of the artificial tree apparatus and during assembly the branch segments folded downwards to mimic a tree.

The branch segments may be configured in various lengths. The branch segments may be colored to match living trees or may incorporate other non-traditional colors, such as for example red, pink, blue, or white.

In accordance with another embodiment, each light emitting device may emit a pre-determined light pattern. For example, each light emitting device in a branch segment may blink at a given rate, remain constant, or gain/loss intensity. In other exemplary embodiments, some lighting devices on a branch segment may perform a first function while other lighting devices on the same branch segment may perform a second function, either simultaneously or at different times. For example, a first lighting device may blink while a second lighting device may remain constant on, while a third lighting device may increase/decrease light intensity only when the

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first and second lighting devices remain off. In other exemplary embodiments, a group of light emitting devices may collaborate together to emit the pre-determined light pattern. For example, the light emitting devices may emit different patterns to follow a beat to a popular song.

In accordance with another embodiment, the control system may comprise a single controller or a multitude of controllers. For example, a single controller may be located at the base of the artificial tree apparatus to generate and transmit command signals to respective light emitting devices upon the branch segments. In other exemplary embodiments, each branch segment may include a slave controller and a master controller may be located proximate the base of the artificial tree apparatus. The slave controllers may be located within the respective branch segments or trunk segments, for example.

In accordance with an exemplary embodiment, the axial electrical connectors may include more than three contacts, such as 4, 5, 6, or 7 contacts for example, where each contact may be configured to carry an independent signal. In an exemplary embodiment, a first additional contact carries a first electrical command signal, a second additional contact carries a second electrical command signal and a third additional contact carries a third electrical command signal. For example, the first additional contact may carry an electrical command signal representative of a blinking light pattern, the second additional contact may carry an electrical command signal representative of an alternately fading/constant light pattern, and the third additional contact may carry an electrical command signal representative of a stepped light pattern. If a group of first lighting devices are configured to receive an electrical command signal from the first additional contact, the first lighting devices receive an electrical command signal representative of a blinking light pattern.

In accordance with an exemplary embodiment, the electrical command signal may include different types of data pertaining to illumination. For example, the command signals may include data pertaining to a light pattern. In other examples, the command signals may include data pertaining to a light intensity, such as brightness of an outputted light. In other examples, the command signals may include data pertaining to a light color. In some examples, the electrical command signal may include different types of data pertaining to sound. For example, the command signal may include data pertaining to a song or a musical note. In an exemplary embodiment, some trunk segments or branch segments may include speakers for outputting a sound received by the electrical command signal.

In various embodiments, apparatus and methods may involve a controller having a voice activated light controller. A command signal may be generated based upon a voice command given to the controller. For example, a user may speak the words "blinking red channel 1," and the controller would interpret the voice command, generate, and transmit an electrical command signal along channel 1 wire that causes the light emitting devices to output a red colored blinking pattern. In some embodiments, a tangible on/off switch may be incorporated into the controller and/or light emitting devices. For example, the user may turn the light emitting devices on and off via a special touch sensor ornament (e.g., a metal snowflake) that is permanently attached to the artificial tree apparatus.

In various embodiments, signal and power carrying wires may be strung internally through the trunk segments such that there will be no visibility of the signal and power carrying wires from an outside of the trunk segments. In some embodiments, wireless transmission may be used to communicate a

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command signal to one or more light emitting devices. In other embodiments, a wireless transmission may be used to communicate a command signal to a receiver local to the respective branch segment, where the branch segment then directs the command signal to the light emitting devices upon the respective branch segment via wired or wireless transmission.

In various embodiments, an electric motor may be incorporated into the base of the artificial tree apparatus to cause the artificial tree apparatus to rotate. In some implementations, a wireless remote control permits the user to turn the light emitting devices on and off, as well as turn the motor on and off. The motor may be connected to the base, such as for example to the top of the base through a plug and socket arrangement.

In accordance with an exemplary embodiment, a control system may generate a plurality of electrical command signals each intended for a specific group of light emitting devices on a singular branch segment or singular trunk segment. For example, a first trunk segment may be configured to receive a first electrical command signal representative of a red blinking pattern. The red blinking pattern may be transmitted to each of the light emitting devices directly connected to the first trunk segment. In some examples, a second trunk segment may be configured to receive a second electrical command signal generated by the control system and representative of a blue constant on pattern. The blue constant on pattern may be transmitted to each of the light emitting devices directly connected to the second trunk segment.

By way of example and not limitation, load devices may include motors, audio transducers, light emitting diodes or other light emitting devices, for example, either alone or in combinations. In some implementations, a user-controlled switch may be located upon each trunk segment for corresponding branch segments having load devices. In various implementations, a user-controlled switch may be located next to each branch segment such that each trunk segment may have a plurality of user-controlled multi-position switches, for example. In some examples, a specific command signal may be associated with a specific radial receptacle such that each branch segment may be plugged into a pre-determined radial receptacle determined by the illumination pattern and color intended for the light emitting devices connected to the branch segment.

In various examples, one or more branches may be associated with a load circuit. One or more of the load circuits may include a group of light emitting devices. In some implementations, each group of light emitting devices may be manually configured via one or more user-interfaces. In some implementations, adjoining trunk segments may couple via an axially-symmetric connection system that permits connection in any radial orientation relative to the longitudinal axis of the trunk or column. In some examples, the control system may output a plurality of (e.g., electrical, optical) command signals. Each command signal may be, in some embodiments, intended for and/or addressed to a specific predetermined load.

In some embodiments, a communication signal may be transmitted to the controller to command the controller to enter one of a plurality of user-selectable modes. Each mode may be associated with a corresponding illumination signal to be generated and transmitted to the light emitting devices. For example, a wireless transmission having a command for an illumination signal may be sent from a mobile device over a local or wide-area network to the controller. Upon receiving the command, the controller may then generate or relay the

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signal to the light emitting devices through the internal transmission wires within the trunk segments and along or through the branch segments.

In various embodiments, a multi-channel signals may include serial, multiplexed, and/or parallel techniques. For example, a single conductive path within the tree column may carry an operating current (e.g., power/return, bias supply, etc. . . .) and, in combination, a time and/or frequency division or multiplexed command or information signal. Multi-channel signals used to control, for example, a plurality of independent load circuits, for example, may share a common conductive transmission path in addition to a common return path, for example. Multi-channel signals may include, by way of example, and not limitation, time-division multiplex, frequency division multiplex, space-division multiplex, amplitude modulation, frequency modulation, phase modulation, quadrature keying, and other known modulation techniques for encoding one or more independent signals. As such, for example, a power line carrier technique could be employed to control a plurality of independent loads with a two wire system that supplies operating current to all of the loads simultaneously.

In an illustrative example, a two wire system could provide power, return, and a modulated signal encoding a multiplexed $n=4$ bit (e.g., n may be about 2, 3, 4, 5, 6, 7, or at least about 8 or more) data stream that enables the controller to directly address commands to any of 16 independently addressable loads via the tree column. Commands to be performed at the load device can be formatted in 4 bit chunks to be received by the addressed decoder.

In some implementations, voltage level output from a power supply controlled by the controller may encode a command or information signal that can be detected using level detection circuits, which may be distributed in one or more multiplexer modules or signal routers, for example.

Multi-channel signals may include electrical signals conducted via the tree column. In certain embodiments, multi-channel signals may also include signals or combinations of signals conveyed in various forms via the tree column. By way of example and not limitation, the tree column may convey commands, power, or other information signals via pneumatic, optical (e.g., light, infrared, UV, laser), fiber optic, mechanical (e.g., vibrational, push-rods), magnetic states, electrochemical mechanisms. Signal handling systems within the trunk may include signal transport (e.g., fiber optic, conductor, semiconductor), signal processing (e.g., optical filtering, electromagnetic reflectors, addressable decoders), switching apparatus (e.g., multiplexers, decoders, magnetic switches, hall effect switches, semiconductor switches, logic gates, etc. . . .), and interface apparatus (e.g., transducers, interconnects, transformers, optocouplers, manifolds, etc. . . .).

With reference to the example depicted in FIG. 2, in some embodiments, the first axial electrical connector **215** may not be recessed within the first trunk segment **200** and the inter-segment coupling of the trunk segments **200**, **205** could be made solely by electrical connectors.

Although various examples have been described with reference to decorative plants, other implementations are possible. By way of example and not limitation, a plurality of power, command, and/or information signals may be communicated via signal paths disposed within a central pole member, for example, in a household floor lamp. Various advantages may accrue to such products, for example, in easy of manufacture, high performance capability, and/or improved electrical safety.

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A number of implementations have been described. Nevertheless, it will be understood that various modification may be made. For example, advantageous results may be achieved if the steps of the disclosed techniques were performed in a different sequence, or if components of the disclosed systems were combined in a different manner, or if the components were supplemented with other components. Accordingly, other implementations are within the scope of the following claims.

What is claimed is:

1. An artificial tree apparatus, comprising:

a first trunk segment having a first axial electrical connector;

a second trunk segment having a second axial electrical connector, said second axial electrical connector adapted to longitudinally align and connect with said first axial electrical connector in a non-radial dependent manner;

a first branch segment having a first light emitting device, wherein said first branch segment radially extends from said first trunk segment;

a second branch segment having a second light emitting device, wherein said second branch segment radially extends from said second trunk segment; and

a control system configured to generate a first electrical command signal and a second electrical command signal,

wherein operating power for said first and said second light emitting devices and said first and said second electrical command signals are transmitted from said first trunk segment to said second trunk segment via connection of said first and second axial electrical connectors, and wherein said first light emitting device is configured to receive said first electrical command signal and said second light emitting device is configured to receive said second electrical command signal.

2. The artificial tree apparatus of claim 1, wherein said first electrical command signal corresponds to a first light pattern and wherein said second electrical command signal corresponds to a second light pattern.

3. The artificial tree apparatus of claim 2, wherein said first light pattern is different from said second light pattern.

4. The artificial tree apparatus of claim 3, wherein said first light pattern comprises a first light color and wherein said second light pattern comprises a second light color.

5. The artificial tree apparatus of claim 3, wherein said first light pattern comprises a visually perceptible visual light effect.

6. The artificial tree apparatus of claim 1, wherein said control system includes at least one user interface for altering said first electrical command signal or said second electrical command signal.

7. The artificial tree apparatus of claim 1, including a first user interface and a second user interface, wherein said first user interface is adapted for operative route selection of said first electrical command signal or said second electrical command signal to said first light emitting device and wherein said second user interface is adapted for operative route selection of said first electrical command signal or said second electrical command signal to said second light emitting device.

8. The artificial tree apparatus of claim 7, wherein said first user interface is located upon said first trunk segment and wherein said second user interface is located upon said second trunk segment.

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9. The artificial tree apparatus of claim 1, wherein said first light emitting device is comprised of a first LED light string and wherein said second light emitting device is comprised of a second LED light string.

10. The artificial tree apparatus of claim 1, including a plurality of channel wires extending within said first trunk segment and said second trunk segment from said control system for transmitting said first electrical command signal and said second electrical command signal.

11. The artificial tree apparatus of claim 1, wherein said control system is configured to wirelessly receive user input signals from a mobile device, wherein the control system selects a user-selectable mode in response to the wirelessly received user input signals.

12. The artificial tree apparatus of claim 11, wherein one or more of said user input signals includes an address associated with a specific one of said first and said second channels.

13. The artificial tree apparatus of claim 11, wherein one or more of said user input signals is indicative of a selected one of said plurality of user-selectable modes.

14. The artificial tree apparatus of claim 11, wherein the control system is configured to receive the user input signals using a Bluetooth wireless communications protocol.

15. The artificial tree apparatus of claim 11, wherein the control system is configured to receive the user input signals using a ZigBee wireless communications protocol.

16. An artificial tree apparatus, comprising:

a plurality of trunk segments adapted for connection in a non-radial dependent manner, wherein each of said plurality of trunk segments has a plurality of branch connectors;

a plurality of branch segments radially extending from said plurality of trunk segments, each of said plurality of branch segments adapted to connect to one of said plurality of branch connectors;

a plurality of light emitting devices connected to said plurality of branch segments; and,

a control system configured to generate a power signal, a first electrical command signal and a second electrical command signal, the control system configured to output the power signal to a power channel, output the first electrical command signal to a first channel and output the second electrical command signal to a second channel,

wherein said first channel is in electrical connection with a first light emitting device and wherein said second channel is in electrical connection with a second light emitting device, and wherein said first light emitting device is configured to receive said first electrical command signal through said first channel and said second light emitting device is configured to receive said second electrical command signal through said second channel, wherein each of said power, said first and said second channels is transmitted from one of said plurality of trunk segments to one of said plurality of branch segments via one of said plurality of branch connectors.

17. The artificial tree apparatus of claim 16, wherein said first electrical command signal corresponds to a first light pattern and wherein said second electrical command signal corresponds to a second light pattern.

18. The artificial tree apparatus of claim 17, wherein said first light pattern is different from said second light pattern.

19. The artificial tree apparatus of claim 16, wherein said control system includes at least one user interface for altering said first electrical command signal or said second electrical command signal.

20. The artificial tree apparatus of claim 16, including a first user interface and a second user interface, wherein said first user interface is adapted for operative route selection of said first electrical command signal or said second electrical command signal to said first light emitting device and
5 wherein said second user interface is adapted for operative route selection of said first electrical command signal or said second electrical command signal to said second light emitting device.

21. The artificial tree apparatus of claim 20, wherein said
10 first user interface is located upon said first trunk segment and wherein said second user interface is located upon said second trunk segment.

22. The artificial tree apparatus of claim 16, wherein said control system is configured to wirelessly receive user input
15 signals from a mobile device, wherein the control system selects a user-selectable mode in response to the wirelessly received user input signals.

23. The artificial tree apparatus of claim 22, wherein one or more of said user input signals includes an address associated
20 with a specific one of said first and said second channels.

24. The artificial tree apparatus of claim 22, wherein one or more of said user input signals is indicative of a selected one of said plurality of user-selectable modes.

25. The artificial tree apparatus of claim 22, wherein the control system is configured to receive the user input signals using a Bluetooth wireless communications protocol.

26. The artificial tree apparatus of claim 22, wherein the control system is configured to receive the user input signals using a ZigBee wireless communications protocol.
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